

MATERIAL SAFETY DATA SHEET

SRM Supplier: National Institute of Standards and Technology
Standard Reference Materials Program
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SRM Number: 1632c
MSDS Number: 1632c
SRM Name: Trace Elements in Coal

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SECTION I. MATERIAL IDENTIFICATION

Material Name: Trace Elements in Coal (Bituminous)

Description: Coal is formed naturally from fossilized plants, consisting of amorphous carbon with various organic and inorganic compounds. These compounds form conjugated polyaromatic, polyunsaturated, and polysaturated ring structures with heterocycles containing oxygen, nitrogen, and sulfur.

SRM 1632c consists of a 50 g bottle of bituminous coal dust with a nominal sulfur value of 1.5 %. It was ground to pass a 250 μm (60-mesh) sieve, homogenized, and bottled under an argon atmosphere.

Other Designations: Coal Dust (bituminous coal; ground bituminous coal)

CAS Registry Number: Not assigned for coal dust

DOT Classification: Not regulated by DOT

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Component	Nominal Concentration (%)	Exposure Limits and Toxicity Data
Coal Dust	~ 100	OSHA PEL-TWA: 2 mg/m ³ (respirable particulate; <5 % SiO ₂)
		OSHA PEL-TWA: 0.1 mg/m ³ (respirable particulate; >5 % SiO ₂)
		ACGIH TLV-TWA: 0.9 mg/m ³ (respirable particulate; bituminous)

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Coal
Appearance and Odor: a black powder with little or no odor
Specific Gravity: 1.2 to 1.7
Vapor Pressure (@ 25 °C): negligible
Water Solubility: negligible

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Available **Method Used:** Not Available **Autoignition Temperature:** > 601 °C (cloud)
> 200 °C (layer)

Flammability Limits in Air (Volume %): **UPPER:** None reported
LOWER: > 50 g/m³ (0.05 oz/ft³)

Extinguishing Media: For small fires, use dry chemical, sand, earth, water spray, or regular foam. For large fires involving coal dust, use water spray or regular foam.

Unusual Fire and Explosion Hazards: This material is a severe fire hazard when exposed to heat or flames. Airborne coal dust is an explosion hazard.

Special Fire Procedures: Since the fire may produce toxic fumes, fire fighters should wear self-contained breathing apparatus (SCBA) and full protective clothing. Cool containers with water spray until well after the fire is extinguished.

SECTION V. REACTIVITY DATA

Stability: X **Stable** **Unstable**

Coal dust is stable at normal temperatures and pressure.

Conditions to Avoid: Avoid heat, flames, and sources of ignition.

Incompatibility (Materials to Avoid): Keep this material from oxidizing agents.

See Section IV: "Fire and Explosion Hazard Data".

Hazardous Decomposition or Byproducts: Thermal oxidative decomposition of coal dust can produce oxides of carbon.

Hazardous Polymerization **Will Occur** X **Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: X **Inhalation** **Skin** X **Ingestion**

Health Hazards (Acute and Chronic): Exposure to coal dust can occur through inhalation, ingestion, and eye contact. Dust may cause minimal irritation to the eyes and respiratory tract.

Signs and Symptoms of Exposure: Acute exposure to coal dust can cause coughing, wheezing, and shortness of breath. Long-term effects include chronic bronchitis and emphysema.

Medical Conditions Generally Aggravated by Exposure: Any individual with a chronic pulmonary disorder should protect against exposure to coal dust.

Listed as a Carcinogen/Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	<u> </u>	<u> X </u>
In the International Agency for Research on Cancer (IARC) Monographs	<u> </u>	<u> X </u>
By the Occupational Safety and Health Administration (OSHA)	<u> </u>	<u> X </u>

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Wash affected area well with soap and water. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance.

Inhalation: If inhaled, move the victim to fresh air. If breathing is difficult, give oxygen; if the victim is not breathing, give artificial respiration by qualified personnel. Obtain medical assistance if necessary.

Ingestion: If ingestion occurs, wash out mouth with water. **DO NOT** induce vomiting. If a large amount is swallowed, obtain medical assistance.

TARGET ORGAN(S) OF ATTACK: lungs

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material Is Released: Notify safety personnel of leaks and spills. Remove sources of heat or ignition and provide adequate ventilation. Personnel performing the cleanup should use protection against inhalation. Clean up coal dust in a manner that avoids dispersing particulates into the air or environment. A water spray may be used to cautiously wet down coal dust to avoid raising dust. Use nonsparking tools; collect dust in a covered metal container for reclamation or for disposal.

Waste Disposal: Follow all applicable federal, state, and local regulations governing disposal.

Handling and Storage: Use methods to minimize dust. Provide adequate ventilation. Use explosion proof equipment. Provide approved respiratory apparatus for nonroutine or emergency use where ambient concentrations of coal dust exceed prescribed exposure limits. Workers should use appropriate personal protective clothing and equipment that must be carefully selected, used, and maintained to be effective in preventing skin and eye contact with coal dust. The selection of the appropriate personal protective equipment should be based on the extent of the worker's potential exposure to coal dust. An eye wash station and washing facility should be readily available near handling and use areas.

NOTE: Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Store material in its original, tightly-sealed bottle in a cool, dry, well-ventilated area away from sources of heat, sparks, open flames, sunlight, intense sources of radiation, and oxidizing agents. Protect containers from physical damage.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: Occupational Safety and Health Administration, U.S. Department of Labor; Coal Dust (<5 % SiO₂) <http://www.osha.gov/SLTC/healthguidelines/coal-dust-less5percentsio2/index.html> (Revision Date: 22 April 1999).
MDL Information Systems, Inc., MSDS *Coal Dust*, 15 December 2003

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data on the MSDS. The certified values for this material are given on the NIST Certificate of Analysis.